Subacute Bacterial Endocarditis Secondary to Lactobacillus Species

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Subacute Bacterial Endocarditis Secondary to Lactobacillus Species

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Abstract

Introduction

Lactobacillus species are usually considered nonpathogenic normal flora of the oral cavity and are some of the most common causative organism of dental caries. Conversely, they are rare causative agents in subacute bacterial endocarditis, which is usually caused by *Streptococci* and *Staphylococcus aureus*.

Methods and Results

This is a case of a 55-year old female with a history of aortic stenosis and type II diabetes with end stage renal disease. The patient presented with subacute bacterial endocarditis in the aortic valve secondary to lactobacilli and later became septic. Further imaging showed evidence of multiple septic emboli in the brain with mental status change. Patient eventually had emergent aortic valve replacement due to moderate aortic insufficiency and due to presence of septic emboli, and was treated with 42-day course of IV Gentamycin and IV Penicillin G for *Lactobacillus bacteremia*.

Conclusions

This case report highlights how nonpathogenic organisms like Lactobacillus species can cause life-threatening complexities, such as subacute bacterial endocarditis, resulting in associated systemic complications. It also emphasizes the importance of maintaining good oral hygiene and medical compliance in patients with known history of valvular heart disease.

Introduction

- Major risk factors of infective endocarditis (IE) include valvular heart disease, diabetes mellitus, long term hemodialysis and poor dentition.[2]
- Typical organisms causing IE in non-IV drug abusers with native valve: *Staphylococcus aureus*, *Streptococcus viridians*, and coagulase-negative Staphylococci.[3]
- Management:
  - Stringent antibiotic treatment depending on the organism.
  - Surgical valve replacement is often warranted for scenarios such as valvular dysfunction with symptoms of heart failure, valvular abscess, or persistent bacteremia despite being treated with appropriate antibiotic regimen.[4]
- Lactobacilli species are very rarely involved in IE and are usually considered nonpathogenic common flora of the oral cavity, gastrointestinal tract and the genital tract.[5] They are one of the most common causes of dental caries.[6]
- This case reports a 55-year old female with subacute bacterial endocarditis (SBE) secondary to *Lactobacillus spp*, complicated by sepsis and multiple septic emboli in the brain.
- The purpose of this case report is to showcase a rare cause of SBE secondary to a common oral flora and the complications associated with it.

Case Report

- 55-year old Caucasian female was transferred from an outside hospital for hypoxemia with oxygen saturation of 68% on room air and elevated troponin level of 2.99. She appeared pale and winded with episodes of confusion prior to her transfer.
- Medical history: diet-controlled type 2 diabetes mellitus, hypertension, aortic stenosis, end-stage renal disease on Hemodialysis (HD), hypothyroidism, history of calciphylaxis of lower extremities, no history of intravenous drug abuse.
- Physical examination: patient was breathing comfortably on nasal cannula; appeared alert and oriented to person, place and time; Grade 3/6 systolic ejection murmur in left upper and right upper sternal border; petechiae across lower extremities; trace pedal edema.
- During hospitalization, patient spiked a fever and her cardiac rhythm changed from sinus to atrial fibrillation.
- Echocardiogram showed a thickened tri-leaflet aortic valve with likely vegetation suspicious for SBE, along with moderate aortic stenosis, mild aortic insufficiency and thickened mitral valve leaflets. Left ventricle ejection fraction was 45-50% (Figure 1).
- Blood culture from two different peripheral sites identified Lactobacilli species.
- Evaluation by inpatient dentistry found multiple dental caries.
- Transesophageal echocardiogram confirmed 2 cm bulky vegetation in aortic valve with moderate to severe aortic regurgitation directed towards the anterior mitral leaflet.
- Evidence of vegetation in the aortic valve and gram-positive rods in chains in blood cultures fulfilled Duke's criteria of definite IE (Table 1).
- She was started on 42-day course of IV Gentamycin 70 mg and IV Penicillin G 12 MU to treat Lactobacillus septicemia.
- On hospital day 6, patient had an episode of hallucination, a new cognitive baseline. An MRI of the brain showed multiple septic emboli likely from the vegetation on the aortic valve (Figure 2).
- Patient appeared clinically unstable and was hemodynamically maintained on vasopressors. Repeat echocardiogram showed decreased cardiac function and worsening aortic insufficiency.
- Evaluation by a cardiothoracic surgeon resulted in emergent aortic valve replacement with bovine bioprosthesis.
- Culture of the aortic valve leaflet was positive for Lactobacillus species. Blood culture after surgery grew no organisms.
- Information provided by patient's niece after her surgery indicated the patient had no prior dental procedures and had not seen a dentist for a long period of time. She had started to show some signs of mental status change about a month prior to her hospital admission. Her home was not in habitable condition and she was taking outdated medications.
- After extended intubation, patient was maintained on Biphasic Positive Airway Pressure (BIPAP) for a prolonged period of time before she was able to be weaned off. Her condition improved over time and was discharged to rehabilitation in stable condition.

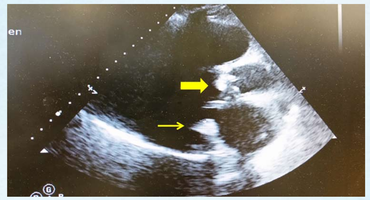

Figure 1. Echocardiogram showing thickened tri-leaflet aortic valve with likely vegetation suspicious for SBE (yellow block arrow), along with moderate aortic stenosis, mild aortic insufficiency and thickened mitral valve leaflets (thin yellow arrow).

Definite diagnosis

Pathological criteria: microorganisms identified by culture or histologic examination of a vegetation, a vegetation that has embolized, or an intracardiac abscess specimen; or active endocarditis confirmed by histologic examination of vegetation or intracardiac abscess

Clinical criteria: two major, one major and three minor, or five minor criteria

Major clinical criteria

Blood culture positive for infective endocarditis

Microorganisms typically associated with infective endocarditis identified from two separate blood cultures: viridans streptococci, Streptococcus bovis, bacteria in the HACEK group, or *Staphylococcus aureus*; or community-acquired enterococci in the absence of a primary focus

Microorganisms consistent with infective endocarditis identified from persistently positive blood cultures: at least two positive cultures of blood samples drawn >12 h apart, or positive results of all of three or a majority of four or more separate blood cultures (with first and last samples drawn at least 1 hr apart)

Single positive blood culture for *Coxiella burnetii* or IgG antibody titer for Q fever phase 1 antigen >1:800

Evidence of endocardial involvement

Echocardiogram positive for infective endocarditis: pendulum-like intracardiac mass on valve or supporting structures, in the path of regurgitant jets, or on implanted material in the absence of an alternative anatomical explanation; abscess; or new partial dehiscence of prosthetic valve)

New valvular regurgitation (worsening or changing of preexisting murmur not a sufficient criterion)

Minor clinical criteria

Predisposition to infective endocarditis, such as a predisposing heart condition, or intravenous drug use

Fever, defined as a temperature >38°C

Vascular phenomena, such as major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhage, and Janeway's lesions

Immunologic phenomena, such as glomerulonephritis, Osler's nodes, Roth's spots, and rheumatoid factor

Microbiologic evidence: positive blood culture but with no major clinical criterion met or serologic evidence of active infection with an organism consistent with infective endocarditis

Possible diagnosis

Clinical criteria (see above): one major criterion and one minor criterion or three minor criteria

Rejected diagnosis

Firmly established alternative diagnosis; resolution of infective endocarditis–like syndrome with antibiotic therapy for ≤4 days; no pathological evidence of infective endocarditis at surgery or autopsy, with antibiotic therapy for ≤4 days; or criteria for possible infective endocarditis not met

* Adopted from Li et al.[1] HACEK denotes Haemophilus species, Aggregatibacter (formerly Actinobacillus) actinomycetemcomitans, Cardiobacterium hominis, Eikenella corrodens, and Kingella kingae.

† Transesophageal echocardiography is recommended in patients with prosthetic valves and possible infective endocarditis according to clinical criteria or infective endocarditis complicated by paravalvular abscess; transthoracic echocardiography is recommended as the first test in other patients.

Table 1. Duke's Criteria of Infective Endocarditis.

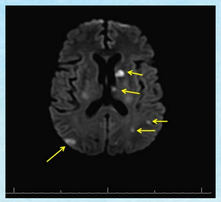

Figure 2. MRI of the Brain showing multiple foci compatible with septic emboli (yellow arrows) .

Discussion

- The rarity of the SBE in this case is due to the nonpathogenic nature of lactobacilli. There are very few cases reported of SBE secondary to *Lactobacillus spp*.
  - A 1991 case reported a 41-year old male with SBE secondary to *Lactobacillus casei* in Korea who had a dental procedure 3 month prior to the infection.[5] Patient was treated with ampicillin and his condition improved.
  - A case report in 2004 described a 53-year male with past history of rheumatic fever who had dental extraction 3 months before developing SBE secondary to *Lactobacillus casei* on the aortic valve.[8] Due to unimproved fever and hemodynamic instability in spite of being on antibiotics, patient subsequently had aortic valve replacement, treated with doxycycline. Patient's condition improved gradually.
  - A recent 2014 case described a 17-year old female with complex cyanotic congenital heart disease who developed IE secondary to *Lactobacillus* 20 months after a cardiac procedure.[9] The infection was treated and resolved by antibiotic regimen of penicillin, clindamycin and gentamicin.
- A 2005 retrospective review of lactobacilli IE showed[10]:
  - 63% of cases had structural heart disease.
  - 47% of cases had dental procedure or predisposing dental condition.
  - 26% of the cases had systemic emboli.
- It is highly possible the patient in this report developed SBE on the aortic valve that was already moderately stenotic due to medical noncompliance and poor oral hygiene.
- The suspected causative organism was Lactobacillus from her dental caries. Gradually she became bacteremic and developed septic emboli in her brain, causing gradual mental status change.
- Thus she was started on antibiotics to treat the bacteremia, and subsequently received aortic valve replacement due to moderate aortic insufficiency and the presence of septic emboli in the brain.
- The case highlights how lack of personal hygiene may lead, what is thought as normal nonpathogenic flora, to induce complications such as sepsis and septic emboli in the brain.
- Further, as shown in this case, proper oral hygiene may be imperative in patients with known valvular disease.

Conclusion

- This case report exhibits a clinical diagnosis secondary to a rare causative organism part of the common human flora, *Lactobacillus spp.*
- *Lactobacillus* is common flora of the oral cavity and is involved in the pathogenesis of dental caries.
- Patients with a known valvular disease are at a risk of developing SBE.
- In the case of this 55-year old female, her risk was exacerbated by factors including poor oral hygiene, a medical history of diabetes and on long term HD.
- She had mental status changes about a month prior to her admission secondary to septic emboli in the brain.
- During hospitalization she was treated with a 42-day course of IV Penicillin G and IV Gentamycin to treat lactobacilli bacteremia, and subsequently received aortic valve replacement due to moderate aortic insufficiency and presence of septic emboli in the brain. Her condition gradually stabilized and improved over time.

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